

## BEST AVAILABLE COPY

We claim:

1. A peptide that immunospecifically binds to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsaA.
2. The peptide described in claim 1 wherein the monoclonal antibody is chosen from the group consisting of 1B6E12H9, 3C4D5C7, 4E9G9D3, 4H5C10F3, 6F6F9C8, 8G12G11B10, and 1E7A3D7C2.
3. The peptide described in claim 1 wherein the peptide is 10-25 residues in length.
4. The peptide described in claim 1 wherein the peptide is 12-22 residues in length.
5. The peptide described in claim 1 wherein the peptide is 15 residues in length.
6. The peptide described in claim 1 which is immunogenic against *S. pneumoniae* comprising residues whose sequence is chosen from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, a fragment of SEQ ID NO:5, a fragment of SEQ ID NO:6, a fragment of SEQ ID NO:7, and a fragment of SEQ ID NO:8.
7. A peptide whose sequence results from the method comprising the steps of:
  - (a) providing a library comprised of random oligonucleotides, wherein the oligonucleotides are about 30-45 nucleotides in length;
  - (b) splicing the oligonucleotides of the library into the gene for the gene III coat protein of a filamentous bacteriophage in frame with the codons for the amino acid residues of the coat protein, wherein the gene for the gene III coat protein is contained within the bacteriophage genome, thereby creating a bacteriophage library, and wherein the oligonucleotides are positioned within the gene such that

when the coat protein is expressed and incorporated into a complete bacteriophage particle, the peptide is available as an epitope to which an antibody can bind;

(c) expanding the bacteriophage library harboring the oligonucleotide library by culturing the bacteriophage library in a host which the bacteriophage infects;

(d) screening the expanded bacteriophage library for a specific bacteriophage particle that immunospecifically reacts with a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* pneumococcal surface adhesion A protein (PsaA); and

(e) sequencing the gene for the coat protein of the specific bacteriophage particle obtained in step (d) thereby yielding the nucleotide sequence of that member of the oligonucleotide library whose translation product has the sequence of the peptide potentially capable of eliciting protective immunity against *Streptococcus pneumoniae*.

8. A therapeutic composition comprising one or more peptides that immunospecifically bind to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsaA, and an immunostimulatory carrier, wherein the therapeutic composition confers protective immunity against *S. pneumoniae* infection when administered to a subject.

9. The therapeutic composition described in claim 8, wherein at least one peptide is 10-25 residues in length.

10. The therapeutic composition described in claim 8 wherein at least one peptide is 12-22 residues in length.

11. The therapeutic composition described in claim 8 wherein at least one peptide is 15 residues in length.

12. A therapeutic composition comprising one or more peptides that immunospecifically bind to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsaA and that are immunogenic against *S. pneumoniae*, the peptides comprising residues whose

aa  
sequences are chosen from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, a fragment of SEQ ID NO:5, a fragment of SEQ ID NO:6, a fragment of SEQ ID NO:7, and a fragment of SEQ ID NO:8; and an immunostimulatory carrier, wherein the therapeutic composition confers protective immunity against *S. pneumoniae* infection when administered to a subject.

13. A method for conferring protective immunity in a subject against *S. pneumoniae* infection, said method comprising the step of administering to the subject a therapeutic composition comprising one or more peptides that immunospecifically bind to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsA and that are immunogenic against *S. pneumoniae*, the therapeutic composition further comprising an immunostimulatory carrier.

14. The method described in claim 13, wherein the peptides comprise residues whose sequences are chosen from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, a fragment of SEQ ID NO:5, a fragment of SEQ ID NO:6, a fragment of SEQ ID NO:7, and a fragment of SEQ ID NO:8.

aa  
15. A peptide comprising a sequence which is at least 80% identical to a peptide whose sequence is chosen from the group consisting of SEQ ID NO:5 or an immunogenic fragment thereof, SEQ ID NO:6 or an immunogenic fragment thereof, SEQ ID NO:7 or an immunogenic fragment thereof, and SEQ ID NO:8 or an immunogenic fragment thereof.

16. A therapeutic composition comprising one or more of the peptides described in claim 15 and an immunostimulatory carrier, wherein the therapeutic composition confers protective immunity against *S. pneumoniae* infection when administered to a subject.

17. A method for conferring protective immunity in a subject against *S. pneumoniae* infection, comprising the step of administering to the subject the therapeutic composition described in claim 16.

18. A therapeutic composition comprising one or more of the peptides described in claim 15 and an adjuvant, wherein the therapeutic composition confers protective immunity against *S. pneumoniae* infection when administered to a subject.

19. A method for conferring protective immunity in a subject against *S. pneumoniae* infection, comprising the step of administering to the subject the therapeutic composition described in claim 18.

20. A therapeutic composition comprising one or more peptides that immunospecifically bind to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsA and that are immunogenic against *S. pneumoniae*, the peptides comprising residues whose sequences are chosen from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, a fragment of SEQ ID NO:5, a fragment of SEQ ID NO:6, a fragment of SEQ ID NO:7, and a fragment of SEQ ID NO:8; and an adjuvant, wherein the therapeutic composition confers protective immunity against *S. pneumoniae* infection when administered to a subject.

21. A method for conferring protective immunity in a subject against *S. pneumoniae* infection, said method comprising the step of administering to the subject a therapeutic composition comprising one or more peptides that immunospecifically bind to a monoclonal antibody obtained in response to immunizing an animal with *Streptococcus pneumoniae* PsA and that are immunogenic against *S. pneumoniae*, the therapeutic composition further comprising an adjuvant.

22. The method described in claim 19, wherein the peptides comprise residues whose sequences are chosen from the group consisting of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, a fragment of SEQ ID NO:5, a fragment of SEQ ID NO:6, a fragment of SEQ ID NO:7, and a fragment of SEQ ID NO:8.